

Claims

What is claimed is:

1. An airboat comprising:
 - a hull;
 - an engine disposed in said hull;
 - an air rudder;
 - a counter rotating air propeller drive system;
 - said drive system including:
 - a housing;
 - a first drive;
 - a second drive;
 - and a third drive;
 - said housing supporting said first drive in engaging relationship with said second drive;
 - said housing supporting said first drive in engaging relationship with said third drive;
 - said third drive including an air propeller mount for receiving a first air propeller;
 - said second drive coupled to an air propeller output drive shaft for receiving a second air propeller;
 - wherein operation of said first drive operates said second drive in a first direction and said first drive operates said third drive in an opposite direction for counter rotating said air propeller mount and said air propeller output drive shaft.
2. The drive system as in claim 1 wherein:
 - said first drive includes a first housing member retaining said first drive in relationship with said second drive and said third drive.
3. The drive system as in claim 1 or 2 wherein:

said second drive includes a second housing member retaining said second drive in relationship with said first drive.

4. The drive system as in claim 3 wherein:
said third drive includes a third housing member retaining said third drive in relationship with said first drive.
5. The drive system as in claim 1, 2, or 3 wherein:
said first drive is a first bevel gear;
said second drive is a second bevel gear; and
said third drive is a third bevel gear;
wherein teeth on said first bevel gear engage teeth on said second bevel gear, and said teeth on said first bevel gear engage teeth on said third bevel gear for counter rotating said second bevel gear and said third bevel gear.
6. The drive system as in claim 5 wherein:
said third drive includes a mount for receiving a first air propeller hub and
said first air propeller is coupled to said first air propeller hub.
7. The drive system as in claim 6 wherein:
said air propeller output drive shaft includes a mount for receiving a second air propeller hub and said second air propeller is coupled to said second air propeller hub.
8. The drive system as in claim 5 wherein:
teeth on said first bevel gear engage teeth on said second bevel gear and
said teeth on said first bevel gear engage teeth on said third bevel gear for rotating said air propellers at the same speed.
9. The drive system as in claim 5 wherein:

A first region of teeth on said first bevel gear engage teeth on said second bevel gear and a second region of teeth on said first bevel gear engage teeth on said third bevel gear for rotating said air propellers at differential speeds.

10. The drive system as in claim 1 further including:

- a second housing;

- a fourth drive;

- a fifth drive;

- an interconnecting drive shaft; and

- a frame;

said second housing supporting said fourth drive in engaging relationship with said fifth drive,

said interconnecting drive shaft engaging said fourth drive and said interconnecting drive shaft engaging said first drive,

wherein rotating said fourth drive rotates said interconnecting drive shaft for rotating said first drive.

11. The drive as in claim 10 wherein:

said fourth drive includes a fourth housing member retaining said fourth drive in relationship with said fifth drive.

12. The drive as in claim 11 wherein:

said fifth drive includes a fifth housing member retaining said fifth drive in relationship with said fourth drive.

13. The drive as in claim 11, or 12 wherein:

- said fourth drive includes;

- a fourth bevel gear; and

- said fifth drive includes:

- a fifth bevel gear;

wherein teeth on said fourth bevel gear engage teeth on said fifth bevel gear for rotating in operation said interconnecting drive shaft.

14. The drive as in claim 13 wherein:

said fifth bevel gear includes a mount for receiving an input drive shaft for rotating in operation said fifth drive.

15. A counter rotating air propeller drive system comprising:

a housing;

a first drive;

a second drive;

and a third drive;

said housing supporting said first drive in engaging relationship with said second drive;

said housing supporting said first drive in engaging relationship with said third drive;

said third drive including an air propeller mount for receiving a first air propeller;

said second drive coupled to an air propeller output drive shaft for receiving a second air propeller;

wherein operation of said first drive operates said second drive in a first direction and said first drive operates said third drive in an opposite direction for counter rotating said air propeller mount and said air propeller output drive shaft.

16. The drive system as in claim 15 wherein:

said first drive includes a first housing member retaining said first drive in relationship with said second drive and said third drive.

17. The drive system as in claim 15 or 16 wherein:

said second drive includes a second housing member retaining said second drive in relationship with said first drive.

18. The drive system as in claim 17 wherein:

said third drive includes a third housing member retaining said third drive in relationship with said first drive.

19. The drive system as in claim 18 wherein:

said first drive is a first bevel gear;

said second drive is a second bevel gear; and

said third drive is a third bevel gear;

wherein teeth on said first bevel gear engage teeth on said second bevel gear, and said teeth on said first bevel gear engage teeth on said third bevel gear for counter rotating said second bevel gear and said third bevel gear.

20. The drive system as in claim 19 wherein:

said third drive includes a mount for receiving a first air propeller hub and said first air propeller is coupled to said first air propeller hub.

21. The drive system as in claim 20 wherein:

said air propeller output drive shaft includes a mount for receiving a second air propeller hub and said second air propeller is coupled to said second air propeller hub.

22. The drive system as in claim 19 wherein:

teeth on said first bevel gear engage teeth on said second bevel gear and said teeth on said first bevel gear engage teeth on said third bevel gear for rotating said air propellers at the same speed.

23. The drive system as in claim 19 wherein:

A first region of teeth on said first bevel gear engage teeth on said second bevel gear and a second region of teeth on said first bevel gear engage teeth on said third bevel gear for rotating said air propellers at differential speeds.

24. The drive system as in claim 15 further including:

a second housing;

a fourth drive;

a fifth drive;

an interconnecting drive shaft; and

a frame;

said second housing supporting said fourth drive in engaging relationship with said fifth drive,

said interconnecting drive shaft engaging said fourth drive and said interconnecting drive shaft engaging said first drive,

wherein rotating said fourth drive rotates said interconnecting drive shaft for rotating said first drive.

25. The drive as in claim 24 wherein:

said fourth drive includes a fourth housing member retaining said fourth drive in relationship with said fifth drive.

26. The drive as in claim 25 wherein:

said fifth drive includes a fifth housing member retaining said fifth drive in relationship with said fourth drive.

27. The drive as in claim 25, or 26 wherein:

said fourth drive includes;

a fourth bevel gear; and

said fifth drive includes:

a fifth bevel gear;

wherein teeth on said fourth bevel gear engage teeth on said fifth bevel gear for rotating in operation said interconnecting drive shaft.

28. The drive as in claim 27 wherein:

said fifth bevel gear includes a mount for receiving an input drive shaft for rotating in operation said fifth drive.